

IAS

Student

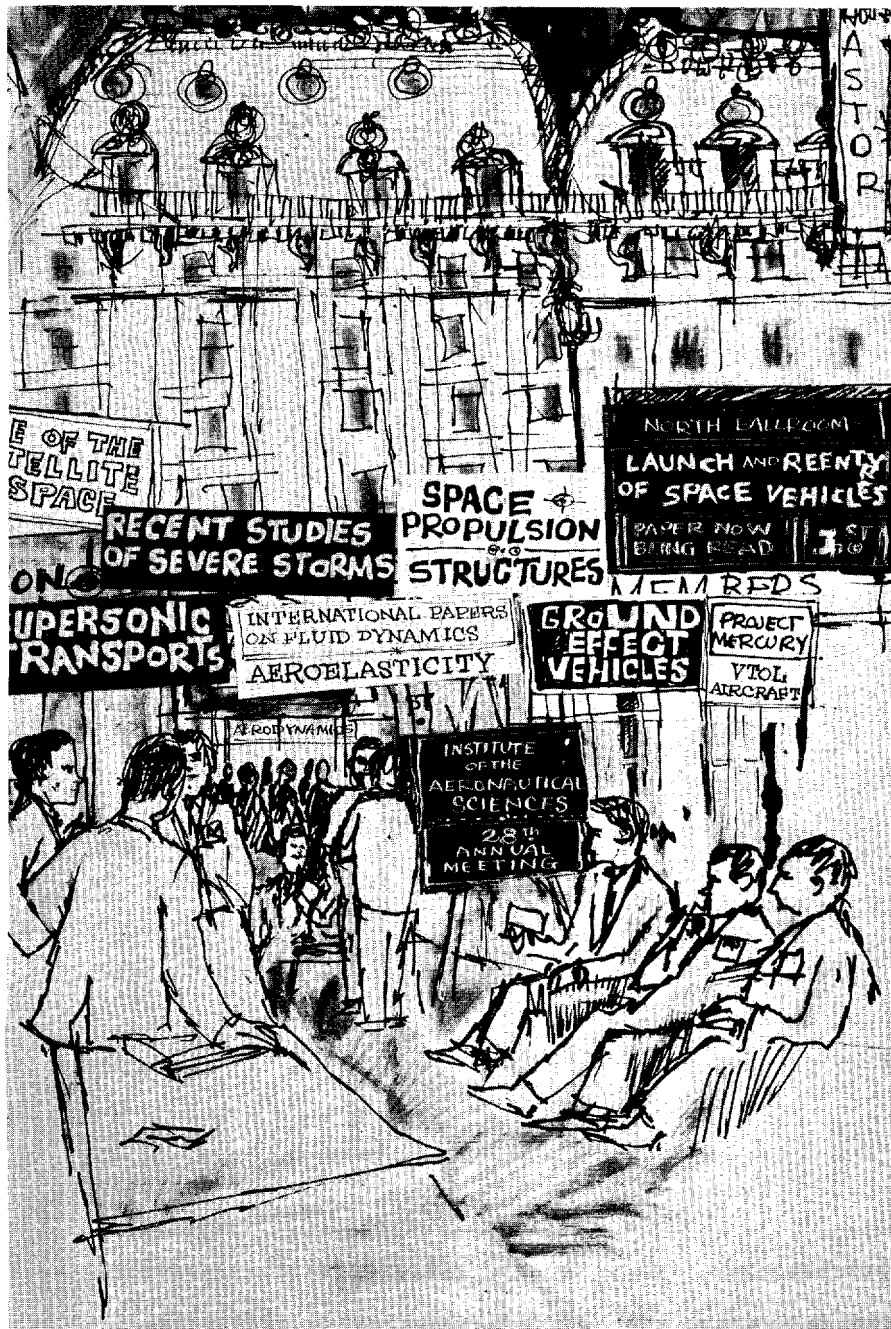
News

Vol. 3 No. 5

February/March 1960

28TH ANNUAL MEETING

"REACHING OUT AS FAR AS WE CAN"



DURING the 3-day gathering (Jan. 25-27) at the Hotel Astor in New York, S. Paul Johnston, Director of the IAS, was interviewed by CBS Radio in connection with a special program they prepared on the 28th Annual Meeting. Mr. Johnston was asked to compare the 28th with the 1st, which he also attended. He replied, "At the early annual meetings people reported on things that had actually been done. Now the tendency is to speak out on what might be done, reaching out as far as we can."

Mr. Johnston went on, "Some of the concepts discussed and predictions made during the present Meeting might be somewhat improbable, but who can say any or all of them are impossible? Anybody would have to be fairly courageous to say this or that will not happen in the areas in which the IAS works."

For the 2100-plus delegates who jammed technical sessions the sky was the limit at a Meeting that laid heavy stress on space vehicles and the problems of space flight. However, the papers presented and the discussions they generated had as their foundations sound research and much experimentation. If predictions lofted into the farther reaches of space, actual promises were made with caution and without dramatics.

This was a gathering, not of space cadets, but of seasoned professionals for whom the problems of breaking through frontiers, of getting higher or going faster, are tied in with many down-to-earth considerations of manpower, economics, and the realization that future achievements must be built, layer upon layer, on past results.

Two Samples

AMONG the new concepts presented were two dealing, respectively, with supersonic craft and space vehicles. They are good examples of the main interests of both speakers and audiences. (continued on page 6)

A MINTA MARTIN

STUDENT PUBLICATION of the Institute of the Aeronautical Sciences

Approved For Release 2000/04/13 : CIA-RDP70-00058R000200150162-4

APR 4 REC'D

ALL STUDENT CONFERENCES NOW IN PLANNING STAGE

**Chief Air Force Scientist to speak at
Brooklyn Polytechnic**



THIS sign will go up in seven places during April and May as, one after the other, all 1960 Regional Student Conferences open up shop. As of this writing conference committees are in the thick of plans involving accommodations, meals, speakers, judges and technical sessions—all of which should, if the weather and participating Branches cooperate, result in smooth-running and informative meetings. The dates and locations of each, announced in January's **News**, are again given.

WEST COAST: March 31-April 1 Los Angeles, Calif.
NORTHEASTERN: April 9, Brooklyn Polytechnic Institute, Brooklyn, N. Y.

ST. LOUIS: April 21-22 St. Louis, Mo.

SOUTHWESTERN: April 28-30 Dallas, Texas

MIDDLE-ATLANTIC: April 29-30, West Virginia U., Morgantown, West Va.

SOUTHEASTERN: May 5-6 Atlanta, Ga.

DETROIT: May 9, Wayne State U. Detroit, Mich.



LAST YEAR, IN ATLANTA, A TECHNICAL SESSION IS HELD ON GEORGIA TECH'S CAMPUS.

Flax at B.P.I.

ONE of the first conferences to be held—the Northeastern at Brooklyn Poly., is also among the first to announce its principal banquet speaker. Alexander H. Flax, Chief Scientist, U. S. Air Force, will talk to dinner guests the evening of April 9. Professor Flax, a Member in the IAS, has been more than usually involved in Institute activities over the past months. Author of the 23rd Wright Brothers' Lecture, a yearly IAS event, in rapid succession Professor Flax presented his paper, "High Temperatures in Hypersonic Flow—Physical Principles and Experimental Techniques" at IAS Section meetings in Washington, D. C., Cleveland, Los Angeles, and Dallas. (It will be published in an early issue of the **Journal of the Aero/Space Sciences**). Before that, in October, during the 7th Anglo-American Conference, Professor Flax gave a paper, "Similarity and Flight Simulation in Hypersonic Test Facilities." His appearance in April is, therefore, one more notable contribution by him to an important IAS program. His exact topic, not yet confirmed, will more than likely



GOING OVER PRELIMINARY CONFERENCE ARRANGEMENTS

center around the relationship between science and engineering particularly in relation to aeronautics.

The importance and value of these annual student conferences should by now be clear to all. Since the first such conference was held in 1948 in Detroit, they have continued a steady growth both in prestige and in numbers participating each year. Past banquet speakers have included Igor I. Sikorsky, Dr. Theodore Von Karman and William Littlewood. IAS Sections always show an active interest in conferences. Many members take time off from busy jobs to attend technical sessions, social activities, to listen to and meet student members. Often they serve as conference judges. The Los Angeles, St. Louis, Southwestern and Southeastern conferences are organized by Sections; all conferences receive a helping hand when needed.

Conference Plusses

THE conferences are the culmination of each year's Student Activities program. Because they are every effort should be made by Branches to attend one or more. All underwrite—at least partially—travel expenses. 1st, 2nd, and 3rd place prizes (at \$100.00, \$75.00, \$50.00) are awarded in three categories: Doctorate, Masters and Undergraduate. But the most valuable plus factors in attending a student conference are the challenge in preparing and presenting a paper, the chance to meet and exchange ideas with other schools and industry representatives, to actively participate in the kind of professional meeting that more and more these days is being made a part of industry's overall interests and activities. ▲

EXTRA

Just before press time it was announced by the Southeastern Conference Committee that Ray Sharp, Director of NASA's Lewis Research Center (Cleveland) would be principal banquet speaker in Atlanta. Mr. Sharp is a past President of the IAS.

0001704

001084331

Branch News

CALIFORNIA STATE POLY (SAN LUIS OBISPO) 109

This year's membership committee headed by Mr. Lee Gilbert did a tremendous job. When the campaign closed they had rounded up 109 active members.

Branch Members have started a canvas for industrial magazines and newsletters so they might become familiar with companies with which they will find future employment. Methods of keeping in direct contact with IAS Branch alumni are also being planned.

At the regular meeting (Nov. 19) Members heard guest speaker K. E. Van Every, Chief Engineer of the Aerodynamics Section, Douglas Aircraft (El Segundo). Mr. Van Every, twice winner of the Wright Brothers' Medal, spoke on "Design of High Speed Manned Aircraft," describing work his team did on a proposal similar to the X-15 Project. The discussion of lift and

drag coefficients, pilot limits, structural limitations, heating problems, boundary layer, inertia coupling, etc., as applicable to Mach 2 — Mach 3.8 aircraft, were comprehensive and enjoyed by all.

The first meeting of 1960 found Cal Poly Branch members listening to Mr. Paul Dennies, engineer on Project Rover at Rocketdyne, speak on "Nuclear Rocket Propulsion." Slides were effectively used to explain proposed nuclear propulsion systems along with the possible role they will play in the space age.

Two fine Lockheed films, "Photography in Engineering" and "Reach into Space", describing Lockheed's participation in the space program, were shown at the meeting.

Robert C. Schrader, **Recording Secretary**
Cincinnati U.
W-P AFB VISIT

The months of November and December were very busy ones for the Branch. Activities began with a student-faculty party at Quebec Gardens. Captain

(continued on page 4)

NATIONAL AWARD WINNERS:



JACKSON ...



PRITCHARD ...



RAE ...



STEARMAN ...

STUDENT AWARDS PRESENTED AT ANNUAL MEETING

All four 1959 Minta Martin National Awards were presented during a special luncheon held January 25 in the Emerald Room of the Hotel Astor.

On hand to receive commemorative plaques were Charlie M. Jackson, Jr., a recent graduate from Virginia Polytechnic Institute, winner of the Undergraduate Award, E. Brian Pritchard, also a V.P.I. graduate, winner of the Masters Award, and William J. Rae, a graduate of Cornell University, who tied for the Doctorate Award with Ronald Stearman of the California Institute of Technology, who was unable to attend.

Duplicate plaques went to Professor Robert W. Truitt, Branch Faculty Advisor at V.P.I., Professor Donald L. Turcotte, Faculty Advisor of Cornell's Student Branch, and Professor Max L. Williams, Faculty Advisor at Cal. Tech. All three were at the luncheon to receive the plaques on behalf of their schools. In addition, Professor Donald E. Ordway, former Faculty Advisor at Cornell, attended the proceedings as a special guest.

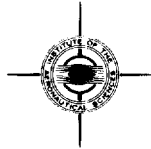
Presenting the plaques William Littlewood, retiring IAS President, described the scholastic achievements they stand for as, "representing a great deal of work. The winners have the right to be proud. Without a doubt the future of the IAS lies with the students." Mr. Littlewood (who attended four of last year's student conferences) went on to say, "I was particularly impressed by

four things: the number of schools competing, the number of individual students giving papers, the close collaboration between faculty and students, also the number of letters received about these papers after they were published.

The National Awards are the culminating event of each year's Regional Student Conferences. Both Mr. Jackson and Mr. Pritchard gave their winning papers at the Southeastern Student Conference, held last April in Atlanta, where each received respectively first place Undergraduate and Masters prizes. Both men are now with the National Aeronautics and Space Administration, working at NASA's Langley Research Center as Research Engineers. Mr. Rae won the Doctorate Award at the 1959 Northeastern Conference hosted by Cornell. He is now with the Cornell Aeronautical Labs in Buffalo, New York. Mr. Stearman received the Doctorate Award at the West Coast Student Conference held last May in Los Angeles. He is at Cal. Tech's Guggenheim Aeronautical Laboratory in Pasadena.

All papers winning first place at the seven annual Student Conference are collected and published each summer by the IAS. They are then judged for the National Awards by a 4-man board appointed by the Institute, composed of leading educators, government and industry scientists and engineers. ▲

BRANCH NEWS



Cincinnati U. (cont'd)

Burkholder, AFROTC Staff, gave an interesting talk on "The Need for Engineers and Technical People in the Air Force". In this talk, he told of millions of dollars of intricate equipment being maintained by people with possibly a high school education, but many times with less, and he expressed the grave need for engineers to direct efforts for better maintenance.

In late November an all-day trip was taken to Wright-Patterson AFB (Dayton). Members visited the Aeronautical Research Laboratory's Physical Sciences Building where basic research is being conducted in the fields of Fluid Mechanics, Physics, Chemistry, and Metallurgy. Here the pilot model of a Mach 5 wind tunnel and an interesting boundary-layer investigation facility were shown. During an afternoon visit to the propulsion laboratory there was a demonstration of a plasma-jet run, and at the aircraft structures laboratory load tests were being conducted on the B-58 "Hustler" and the F-106.

Darrell V. Warner, **Chairman**

Colorado U. HOLIDAY EVENT

Each year the many engineering societies on campus hold an eagerly anticipated competition in the form of a two-hour stage production called **Slide Rule Follies**. The **Follies** provide a unique combination of spicy skits and entertaining short performances. Prizes and trophies are awarded to the societies with the most unusual and appealing productions. This year's program covered a wide range of themes from the conquest of space to an offbeat adaptation of Goldilocks and the Three Bears. With a rendition of the **Shooting of Dan Magroo**, the Branch captured the third place trophy.

The special guest at the Dec. 1st Meeting, Mr. Ralph Swaisgood, Chief Engineer at Forney Aircraft Company, presented a 20 minute color movie on "Forney Industries" and lectured on various aspects of the light-plane industry. Mr. Swaisgood spoke on the opportunities for individuality and rapid advancement for engineers working with smaller aircraft manufacturers. Light planes in business and private aviation were discussed in general but specific reference was made to the 2-place **Fornair** produced by Forney.

James Larsen, **Secretary**

Detroit U. OPTICS

On Jan. 6, the Branch held its semi-monthly meeting and after the usual business was conducted was privileged to hear talks by Mr. Cuny, a U-D graduate, and Mr. Whitmore, both of the Optics Research Laboratory, Chrysler Missile.

Mr. Cuny, after some general remarks about missile classifications according to mission, propulsion, and

guidance, gave an outline of the use of optics in missile control. The electro-optic system being developed at Chrysler, Mr. Cuny explained, makes use of the sensitivity of polarized light to minute angular deflections. By combining this property with an inertial guidance system, orientation of a missile within five seconds of arc may be accomplished in as little as one-tenth of the time required by present systems. Mr. Cuny concluded with a series of pictorial displays showing applications in underwater-to-surface, air-to-surface, and mobile surface-to-surface arrangements.

Mr. Whitmore brought the discussion from the realm of the exotic to the prosaic by describing some on-the-spot malfunctions that crop up in missile work. He explained how, for example, all Jupiters are now equipped with "bath-tub" drains (this after dousing some spilled fuel resulted in several inches of trapped water in the missile bottom). Again, a money-saving solderless type of electrical connection requiring solid wire had to be discarded when it was found that lift-off vibrations worked the solid wire to embrittlement.

All who attended these two discussions had given to them new insight on the missile picture in both theoretical and practical areas.

John E. Raha, **Reporter**



COLORADO U. BRANCH MEMBERS CAUGHT IN A FRONTIER MOOD DURING THEIR PERFORMANCE OF THE "SHOOTING OF DAN MAGROO."—

Photograph by Jim Larsen

Georgia Tech. BRIEFING

The first meeting of the Winter quarter, (Jan. 11) was presided over by the new Chairman, Dave Robinson, who introduced the main speaker of the evening, C. A. Maple of the Wright Air Development Center.

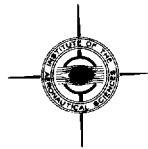
Mr. Maple spoke on the functions of WADC and how they are carried out. He also briefed members on the reorganization that is taking place in WADC, reporting that the name will be changed to Wright Air Development Division to comply with other divisions of the ARDC. Mr. Maple also made some calculated predictions on the power requirements that will be needed in the next decade. The meeting was adjourned at 5:00 p.m. after a question and answer session.

Applied Research

At the meeting (Jan. 26) Dave Robinson, Branch

(continued on next page)

BRANCH NEWS



Georgia Tech (cont'd)

Chairman, introduced Bert Bricker who discussed the Structural Test Laboratory of Lockheed's Georgia Division. The object of this Lab. is to do applied research into structural problems of present and future planes. The Lab. is divided into sections such as Fuel Systems, Hydraulics, Hydrostatics, and the Environment Section. Mr. Bricker used slides and a movie of the hydrostatic test of the C-130 to supplement his talk.

James F. Lowry, **Secretary**

Illinois U. — Chicago RECAP

Oct. 22 the Branch had its field-trip downstate to Urbana. A group of 44 students had an enjoyable and eventful day. Major topics presented to the visitors by Prof. Stillwell, (Asst. Head of the Aero. Dept.) and his staff, were a discussion of shock tubes, a demonstration of both subsonic and supersonic wind tunnels, a demonstration of an analog computer, and a demonstration of a Telsa turbine, still in a developmental stage. Time was also set aside to explore the downstate

term. Recruiting plans for Registration were formulated and refreshments served.

Items . . . Attempts to organize a flying club, led mainly by Chairman Antoine Phillips, led to the setting up of a rival organization, the Civil Air Patrol. Although we helped start it, we are no longer connected with it . . . This semester has been the most active the Branch has had for several years.

Elmer R. Giese, **Secretary**

Illinois U. — Urbana PRIMER ON ASTRONOMY

The Branch held its last meeting of the semester Jan. 6, with a turnout of over 100 Members.

Following the treasurer's report, Chairman Richard Sievers announced that the election of officers for the spring semester will be held at the next meeting.

The guest speaker was Mr. F. L. Koniges of Grumman Aircraft who discussed "The Astronomical Background for Space Travel". Mr. Koniges purposely kept the lecture free from higher mathematics and involved formulas so that more students would be better able to understand the talk. Among the areas covered were time and position references of our solar system, and Kep-

THE 28TH ANNUAL MEETING coincided with a statement by Russia that certain areas of the Pacific ocean were being used by the U.S.S.R. for rocket testing. 3 key men, members of industry, government and the military respectively, passed comment on this Russian declaration. Here is what each said:

Karel J. Bossart (Asst. to the Vice President-Engineering, Convair) said during an interview with the press he thought the Russian move "propaganda, to show their strength."

Allen W. Dulles (Director, CIA) included this comment in his Honors Night Dinner speech. "Thus they flex their muscles in public whereas in the past they have been doing it without publicity. They wish to call attention to the strength of their sinews."

Rear Admiral Paul D. Stroop, USN (Chief, Bureau of Naval weapons), was asked by the press for his opinion of recent Russian statements concerning the accuracy of their rocket tests. He replied he agreed with Secretary of Defense Gates, "if it was true, it's damn good." In further



Karel Bossart meets the press

questioning, Admiral Stroop discarded the threat of Russian ICBMs to a moving U.S. Naval Task Force at sea. Such a force, often spread over an area the size of New York State is not, he felt, dangerously exposed to rocket attack. To attempt to wipe out a task force in this way, Admiral Stroop said, "would only be doing it the hard way." ▲

campus, and to meet with Members of the Urbana Student Branch.

While downstate the Wind Tunnel Committee discussed their project with Prof. Stillwell. He told them the tunnel they proposed would be capable of speeds up to 30 mph, instead of the over 100 mph they hoped for. This news killed the Committee's enthusiasm for the project, and nothing has been done since.

Nov. 19 Prof. Harry H. Hilton (Urbana Branch Faculty Advisor) gave an informative and enjoyable lecture on Thermodynamics.

Dec. 15 Members attended a showing of "Road to the Stars". Produced by Rocketdyne, this film told the story of the development of rocket power, including some modern missile engine tests.

Jan. 13 the last meeting of the semester, it was decided to postpone the election of officers until next

term. Recruiting plans for Registration were formulated and refreshments served.

A short discussion period followed after which refreshments of cider and doughnuts were served.

Kenji Ando, **Secretary**

Louisiana State PLANS & PROJECTS

The Meeting (Dec. 15) was called to order by Branch President T. A. Dardeau. An IAS project for the forthcoming Engineering Day was discussed. Suggestions for this will be submitted during January. The Executive Committee will select a suitable project by 1 February and set up committees for its completion. A field

(continued on page 9)

28th annual meeting—

Speaking at a session on "*Launch and Re-entry of Space Vehicles*," Paul R. Shipps, a preliminary design specialist from Convair (San Diego), presented a summary of studies involving satellite payloads weighing 10 to 20 tons. He said manned vehicles that resemble aircraft more than today's rockets and attain speeds of more than 6,000 mph may prove the cheapest means of boosting heavy payloads into space. Mr. Shipps saw the manned booster as a Delta-winged, rocket powered carrier that could attain such speeds in 5 to 10 minutes of flight.

"In the concept," Mr. Shipps said, "the crew takes a thermos of coffee, climbs aboard and drives up to an orbital rendezvous for an important package delivery. They are back in a few hours, after a couple of orbits—and nervously sweating out the drive home on the freeway."

In the realm of atmospheric flight 2 Lockheed officials said there is no technical, operational, or economic reason why a supersonic transport could not be developed in this country. Burt C. Monesmith, Lockheed vice president and California Division general manager, and Robert A. Bailey, the division's chief engineer, told a session on "*Supersonic Transports*" that, "It certainly is possible a supersonic transport will be in operation somewhere on the world's airlines in the 1970 period . . . (It) is technically feasible as well as financially sound."

Many Sessions

OTHER sessions included, "*Life Support Systems for Space Vehicles*," "*Space Propulsion*," "*Upper Atmosphere Research with Rockets and Satellites*," "*Role of the Satellite in Space*," and a session on "*Bioastronautics*."

In addition to "*Supersonic Transports*," non-space topics were highlighted by sessions on, "*VTOL Aircraft*," "*Ground Effect Vehicles*," "*Recent Studies of Severe Storms*," "*Structures*," and a panel discussion of "*Management Criteria for the Next Decade*." A special session on "*Project Mercury*" is reported elsewhere in this issue.

(Most of the papers presented at the Annual Meeting are published by the IAS. For a list of those available and their cost—usually 50c a paper to members—write the Institute's New York office.)

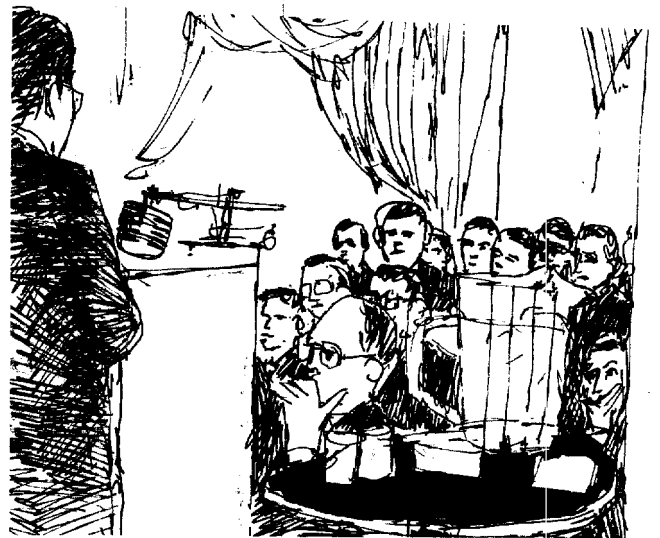
Main Speakers

TO partially sustain members during the busy days were 2 luncheons and the Honors Night Dinner, in addition to numerous meals sponsored by individual committees.

Monday's luncheon, at which the Minta Martin National Awards were presented (see page 3) had as principal speaker Rear Admiral Paul D. Stroop, USN, Chief of the newly created Bureau of Naval Weapons. Admiral Stroop, who participated in the development of the Norden Bombsight during World War II, discussed the new Bureau, stressing the orderly merger of aeronautics and ordnance into one integrated unit.

At a press conference afterwards he was asked about the current status of the Navy's 'Polaris' program. Admiral Stroop referred to a recent statement by Secretary of Defense Thomas S. Gates Jr., that late 1960 is still the scheduled date for the first of the Polaris submarines, the *George Washington*, to receive the IRBM as a fully operational weapons system.

Concerning the location of Polaris patrols in isolated regions, many for 3 months at a time, Admiral Stroop said submarines had long been known for their ability to keep their position a secret, but he admitted if its location became known a patrol "would be in danger" of destruction from a potential enemy.

**Honors Night Dinner****technical session**

AT a luncheon Wednesday Arnold W. Frutkin, Director of International Programs for the National Aeronautics and Space Administration, discussed the importance of international cooperation in space activities, "in fact as well as in name." Mr. Frutkin said, "We wish a true co-operation, not a hiring of scientists of other nations to carry out a program which we have unilaterally determined." At a press conference, Mr. Frutkin did not rule out working with the U.S.S.R. in space programs but stated there must be "substantive contributions" by Russia as well as the U. S.



corridor conversation

AT the Honors Night Dinner, January 26, ceremony accompanied speeches to mark an occasion long an IAS tradition. Over 1500 filled the main ballroom of the Astor Hotel, crowding not only the vast downstairs floor but two tiers above that.

This event marked the last official act of IAS President William Littlewood before turning the gavel over to the 1960 President, Lt. Gen. (Ret.) Donald L. Putt, President of United Research Corp. In addition to presenting the 5 annual Institute awards (see page 10), Mr. Littlewood announced the 2 Honorary Fellows for 1959—the highest honor bestowed by the IAS.

The American Fellowship went to Elmer A. Sperry, Jr., whose contributions in the field of automatic stabilization have made him one of the most respected figures in aviation. The Foreign Fellowship was accepted by E. T. Jones, Deputy Controller for Overseas Affairs with the Ministry

of Aviation, and a distinguished member of the inner circles of British aviation.

The principal speech of the evening was delivered by Allen W. Dulles, Director of the U.S. Central Intelligence Agency. Mr. Dulles chose to, "reminisce a bit about the art and techniques of intelligence in the nuclear-ballistic age."

To those who might have, somewhat optimistically, expected exposure to a few juicy secrets, Mr. Dulles presented the noncommittal front of all Intelligence men. "Intelligence will never be an exact science," he said. "It deals not only with the hardware of national power and of battle, but with the vagaries and uncertainties of human beings and human decisions." He did, however, throw out a tantalizing morsel or two. "The Kremlin's security is good, but a great deal is known to Intelligence beyond the trickle of military information that is given out officially," he said. Further on, commenting about "the stern and relentless competition" between East and West, Mr. Dulles stated, "It is Khrushchev's present expressed intention that this should be competition short of all-out war, but whatever may be our views of his intentions, certainly no other 'holds' will be barred."

Mr. Dulles finished his talk, and the Dinner, by warning, "There is no cause . . . for us to view the future with any easy complacency."

Appraisal

THERE seemed to be little or no tendency for those attending the Meeting to view the future of aviation with complacency, deeply involved as it is in what General Putt described at one point as, "an era of exploding technology."

On the last afternoon three men gathered together at the request of CBS Radio to appraise the past 3 days and to offer their predictions on the next 10 years in aircraft and space research and development.

Discussing these matters were Jerome Lederer (Director, Flight Safety Foundation), Rear Admiral (Ret.) J. B. Pearson Jr. (Director-Development Planning, North American Aviation), and Dr. William R. Sears (Director of Cornell University's Graduate School of Engineering).

They all agreed that if the past decade saw incredible advances in the state of the art, wait for the next one. "The past is a prologue for the future," Mr. Lederer said. Judging from papers presented at the meeting, as well as from their own knowledge, the 3 men foresaw future development in 4 areas: VTOL (considerable helicopter growth with heliports scattered throughout the country); supersonic commercial aircraft (New York to London: 2½ hours), which in turn will bring about more people flying and, according to Mr. Lederer, "tens of hundreds of airports"; Ground Effect Vehicles will find their place for, among other uses, certain kinds of troop movements and rescue operations; an increased space program that would see manned space probes within 20 years, and new kinds of propulsion for control of orbital space vehicles.

"We are almost on the threshold of the exciting technological adventure of all time," Admiral Pearson said. "Within 10 to 15 years this will blossom."

The beginnings of that adventure were spelled out during the 28th Annual Meeting. As to the engineer's role, a remark by Dr. Sears serves as a fitting conclusion:

"The function of the engineer is to tie all the new specializations together into a working piece of hardware. The engineer is the man who integrates it all; he is the man who builds the vehicles." ▲

PROJECT MERCURY: SPECIAL PROGRAM PART OF ANNUAL MEETING

BACKING up the Mercury capsule and its pilot the moment they blast through perhaps man's last frontier and begin orbital sweeps around this planet is a large and skillfull team. 4 of its key men were in New York during the Meeting to present an evening-long program not so much on the astronauts but on the vehicle one of their number will rely on to take him up and bring him safely back down again.

Under the direction of Dr. Abe Silverstein (Director, Space Flight Development, NASA), 3 papers were presented. Maxime A. Faget, Chief of the Space Task Group's Flight Systems Division, discussed "The Mercury Capsule and It's Flight Systems."

"Review, Scope, and Recent Results of Project Mercury Research and Development," was given by Aleck C. Bond, Head of the Task Group's Performance Branch.

The program concluded with a "Review of the Operational Plans for Mercury Orbital Mission," discussed by Charles W. Matthews, Operations Division Chief of the Space Task Group. All 3 men are located at NASA's Goddard Space Flight Center (Beltsville, Maryland).

(These papers are among those published by the IAS. For a complete list and the cost—usually 50c a paper to members—write the Institute's New York office.)

"A Normal Extension"

EARLIER that afternoon the 4 men were interviewed by CBS Radio, part of a show SPACE SURVEY: 1960 (a coverage of the 28th Annual Meeting) heard over the network January 31.

Dr. Silverstein received the first question: Why is there a Project Mercury at all? He replied that space flight was, "a normal extension of man's urge to fly." The current program to place a vehicle some 100 miles out of the earth's atmosphere was a natural development growing from altitudes achieved by certain of our jet fighters.

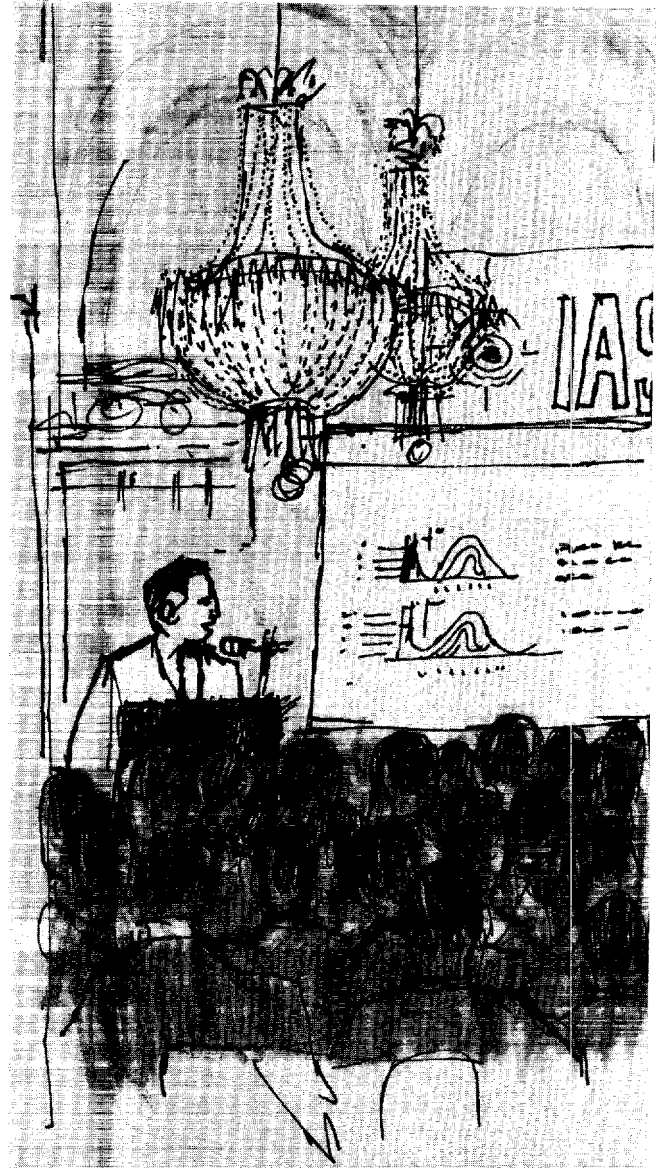
Built upon past accomplishments, Dr. Silverstein went on, man would eventually probe further into space. He did not, however, think it likely other planets would be explored within the next 10 years.

"We will make great strides forward," he predicted, but added achievements would be more in the nature of long-term objectives, "which you sometimes reach earlier than you think," rather than short-term ones, "which often come about later than you guess."

"Largely Engineering Problems"

AFTER Dr. Silverstein's comments the interview took on a conversational tone, with all participants replying as they chose. Topics ranged over the inside appearance of the Mercury capsule, the degree of control the pilot will have during the mission, and some of what Mr. Faget described as the "largely engineering problems" which must be solved before the count-down begins.

Inside, the capsule is similar to modern-day fighter aircraft. Immediately in front of the pilot (who sits facing aft during orbit) is the instrument panel. Through certain parts of the projected flight the astronaut will be in control of the ship, and will in fact be able to take it out of orbit and trigger the deceleration process to bring the capsule back into the earth's atmosphere. During take-off the pilot was described as having only "negative control"—that is, if something goes wrong during the booster stages he

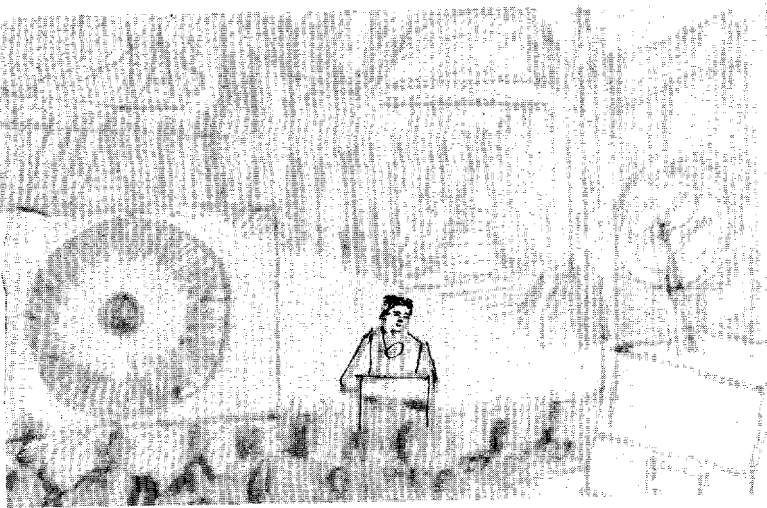


Mercury session

will be able to jettison the capsule away from the rocket and return it to the ground. Other than that the pilot has no control over the propulsion system pushing him into orbit. As Mr. Faget said "he is there for the ride."

Although in many important ways his own master, the journey back to earth will not rest solely with the pilot. Should he, for one reason or another, be unable

(continued on next page)

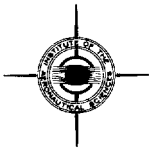


"project mercury—

to manipulate the controls, automatic systems operated from the ground will do the job for him. An automatic timer will be set to bring the capsule down in a predetermined area. This can, however, be reset by the pilot during flight.

Tracking and communications stations located around the globe will give and receive information during the entire mission. What he actually sees must await the pilot's own words. He will be able to watch the earth passing beneath him through a special periscope set in the floor of the capsule. In addition, a window directly in front of the pilot seat will show the horizon of the earth dropping behind him. ▲

BRANCH NEWS



Louisiana State (cont'd)

trip to Keesler Air Force Base (Mississippi) is being planned for January. After the business meeting, films were shown on, "Pilotless Aircraft", "The XF13 Vertijet" and "The Sky Is No Limit." During the performance refreshments were served by Miss Beryl Perez and Miss Marjorie Kollar who are respectively the IAS Branch Sweetheart and the Branch's nominee for the Darling of LSU.

At the next Meeting, scheduled for 7 Jan., test films of the XF-104 will be shown, and Capt. Vinson (AFROTC) will speak of opportunities in the U.S. Air Force.

Robert F. Coady, **Vice-President**

Oklahoma State FLYING AGGIES

On Dec. 3 the Branch held a joint meeting with the "Flying Aggies," a campus organization of private flying enthusiasts. Guest speaker was Miss Jerry Cobb, advertising and sales promotion manager for Aero Design Corp. (Bethany, Okla.) and Aviation's 1959 Woman of the Year. Among other records, Miss Cobb holds the world's speed and altitude record and formerly held the distance record for 3,858 to 6,613 lb. aircraft. These records were all established in the **Aero Commander** which her company builds. She related several interesting experiences encountered during her flying career—one which has taken her all over the world, and has included ferrying B-17s and PB-1s, as well as serving as chief pilot for Executive Aircraft Inc. (Kansas City, Mo.)

a reminder

March 1st is the deadline for submitting applications for the 1960 Flight Test Engineering Fellowship, one of the best in the field. The only basic requirements are a Bachelor's degree in engineering by June of this year and U.S. citizenship. The successful winner, or winners, will receive tuition and stipend covering two years of graduate study at Princeton University. The Award totals \$7,800 for two years' work. Second year renewal is contingent upon satisfactory work and study during the first. Applications can be obtained at, and should be returned to, Flight Test, Institute of the Aeronautical Sciences, 2 East 64th Street, New York 21, N.Y. Winners are usually announced during May. ▲

Change of Command

It is the policy of the OSU Branch to elect new officers each semester. This is to provide more participation and opportunities for the development of leadership.

Elections were held January 21 for officers to serve during the spring semester. The new Chairman is Mark Rendel. He has served us in the past as Engineering Student Council Representative, and is an Assistant Editor for the technical magazine, THE OKLAHOMA STATE ENGINEER. Other officers elected are: Vice-Chairman Bob May, Treasurer Capt. Robert H. McIntosh, Recording Secretary Ronald Bates, Corresponding Secretary Darwin Hawkins, and Student Council Representative Ralph Kuster.

We have big plans for the coming semester, and I will be reporting to you as the meetings progress.

Bill Kuhn, Darwin Hawkins (**Cor. Secretaries**)

Oklahoma U. ROLE

Over 100 Members were present Jan. 6 to hear Robert Rohtert, Chief of Gas Dynamics, McDonnell Aircraft (St. Louis), speak and show slides on "The Role of the Aerodynamicist in the Development of New Aircraft." Prof. L. A. Comp, Faculty Advisor, introduced Mr. Rohtert.

A photograph to be used for the University's Yearbook was also made of the group.

James Gamble, **Secretary**

Purdue NUCLEAR DROP

On Nov. 18, the Branch had as guest speaker Raymond W. Harr. Mr. Harr, who is with the Military Operations Analysis Section, North American (Columbus), spoke on "Use of Aircraft to Drop Nuclear Weapons."

Starting off with a brief background on radiations and pressures resulting

(continued on page 10)

EACH YEAR AT THE HONORS NIGHT DINNER OF THE ANNUAL MEETING FIVE SIGNIFICANT INSTITUTE AWARDS ARE PRESENTED. THE AWARDS AND THE WINNERS FOR 1960 ARE:

John Jeffries Award—to BRIG. GEN. DON FLICKINGER, "For outstanding contributions to the advancement of aeronautics, through medical research." General Flickinger, USAF (Medical Corps) is Assistant for Bioastronautics with the Air Research & Development Command, stationed at Andrews Air Force Base, Washington, D. C. He was one of the leaders in developing and establishing criteria currently in use for the selection of space crews, including the Mercury Astronauts.

(This award, established in 1940, honors the memory of Dr. John Jeffries, an American physician who, with Blanchard, the French balloonist, made the first aerial voyage across the English Channel in 1785, and on a previous flight made the earliest recorded scientific observation from the air.)

Robert M. Losey Award—to HERBERT RIEHL, "In recognition of outstanding contributions to the science of meteorology as applied to aeronautics." Professor Riehl is with the Department of Meteorology, University of Chicago. He is responsible for much of our present knowledge of the jet stream and its relation to weather systems.

(This award, established in 1940, is in memory of Capt. Robert M. Losey, a meteorological officer of the Air Corps, killed at Dombas, Norway, 1940, while serving as an official observer for the U.S. Army—the first officer in the service of the United States to die in the War in Europe.)

Louis W. Hill Space Transportation Award—to JAMES A. VAN ALLEN, "By combining simple and direct techniques with great ingenuity, he established beyond doubt the existence, intensity, and extent of the radiation belts above the earth's surface that now carry his name." Dr. Van Allen is Head of the Dept. of Physics and Astronomy of the State University of Iowa. His studies have contributed immeasurably to advancing attempts to put a man in space.

(This award, established in 1958, carries with it the largest monetary award available through any scientific society—\$5000 to an individual, or up to \$10,000 in the event of a team contribution.)

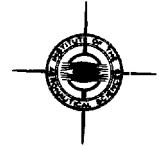
Sylvanus Albert Reed Award—to KAREL JAN BOSSART, "For significant contributions to the design and development of the Atlas Intercontinental Ballistic Missile." Mr. Bossart is Assistant to the Vice-President, Engineering, Convair (San Diego). Popularly known as 'Father of the Atlas', Mr. Bossart was chief engineer for the Atlas program, and now has technical responsibility for Convair's missile programs.

(This award, established in 1933, honors experimental or theoretical investigations which have had a beneficial influence on the development of practical aeronautics.)

Lawrence Sperry Award—to DR. JAMES E. McCUNE, "For outstanding contributions to the theory of flow in axial turbo-machinery and to the theory of magnetoaerodynamics." Dr. McCune is Senior Scientist with the Aeronautical Research Associates of Princeton (New Jersey). His studies provided essential information concerning both the design of transonic compressors and the stimulation of transonic flow through blade rows.

(This award, established in 1936, honors the late Lawrence B. Sperry, pioneer aviator and inventor, who was drowned in 1923, at the age of 31, after a forced landing in the English Channel.) ▲

BRANCH NEWS



Purdue (cont'd)

from a nuclear explosion, he took as an example an aircraft dropping a nuclear bomb, turning, and retreating. He showed through normalized charts how much thermal radiation it would obtain at a given time, and how much pressure it would encounter.

It was interesting to note that it was more feasible to have the plane in the proper altitude with respect to the blast than to have it at a greater distance from the blast. Also, when the pressure shock encountered the aircraft, it would effect the velocity of the air over the wings. Afterward, a little spice was added to the talk when a Hardtrack Test picture of the FJ4 aircraft was shown delivering a nuclear missile.

Nuclear Fusion

The final meeting of the fall semester (Jan. 13) featured an excellent student paper, The Nuclear Fusion Engine, by Fred Carnes.

Mr. Carnes, an exuberant speaker, presented a well organized talk from a paper which he and three other students compiled in a semester's study.

He explained the need for fusion power, what is fusion, the energy source, problems concerned with a nuclear fusion engine, and how nuclear fusion power can be put to use by man. The heart of his paper was the application of a nuclear fusion engine to a propulsion system that can be used in space travel, and the problems that would be encountered.

On Dec. 2, elections were held for the positions of Chairman and Secretary for the new semester. Bruno L. Lohmueller was elected Chairman and Dorothy Walsh, Secretary, both of whom will keep the spirit of our organization high.

William B. DeBellis, Acting Secretary

Southern Cal LOCKHEED VISIT

The University of Southern California is located in Los Angeles, the heart of the aircraft industry. 24 student members took advantage of this fact recently to tour the California Division of Lockheed located in Burbank.

Accompanied by Prof. J. B. Vernon, the group visited the production line of the Lockheed Electra, a 4-engined turbo-prop passenger plane currently in service with many airlines. Starting with sheet metal, the tour progressed through almost every fabrication and assembly step right up to the finished product.

One of the most interesting parts of the tour was the

(continued on next page)

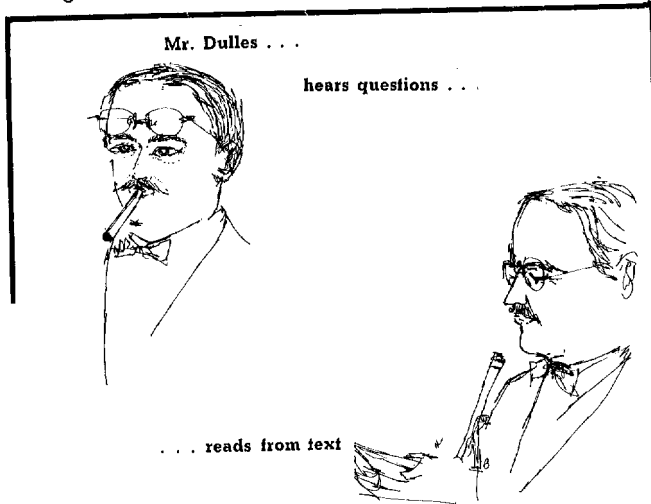
0001708

HOW TO HOLD A SUCCESSFUL PRESS CONFERENCE

(Providing You're the One Being Interviewed)

ALLEN W. Dulles, Director of the Central Intelligence Agency, and keeper of some of the country's most precious secrets, must be known not by what he says but what he doesn't say. While this can possibly be argued as the highest state of grace achievable on this earth, there are drawbacks—particularly for those gentlemen of the press whose fame and fortunes (not to mention jobs) depend on what they are able to say and get others to say.

This conflict of interests was aptly if poignantly brought out during a meeting Mr. Dulles had with the



press (over 60 registered during the Annual Meeting) immediately following his speech at the Honors Night Dinner. Notwithstanding 2 days exposure to the IAS Press room's coffee and donuts quite a sizeable representation from the Fourth Estate was waiting to pounce when Mr. Dulles entered.

His initial approach was full of good cheer and promise. Sweeping in like Santa Claus he patted various and sundry backs, shook all hands offered him, laughed loud and heartily and was, in fact, the first to ask a question: Did anybody have a cigar? One was produced at once and along with it at least ten matches flickered and begged to ignite the tobacco. All the omens were of the best, until Mr. Dulles began the business at hand.

HE never gave interviews, he said flatly. Hadn't given a press interview in years. His strong im-

plication that he wasn't about to break this record daunted none of the reporters crowding around him. As they settled back with pad and pencil their collective attitude seemed to be they'd heard that one before.

One reporter asked if he would at least hear their questions. Sure, Mr. Dulles said. Puffing contentedly away he gave them his full attention.

Was there a U.S.-U.S.S.R. missile gap? Mr. Dulles in his speech mentioned Russia's "mission to Communize the world." What about some specifics? What about Berlin? What was the real significance of Russia's announced rocket testing in the Pacific?

These and other matters were proposed to Mr. Dulles for discussion. To most of them he referred the press to the text of his speech. He didn't intend to go further than he had in that.

He had other engagements to keep before the evening ended and he really should be going.

He didn't give press conferences. Never gave them.

A voice asked if Mr. Dulles would read 2 minutes of his speech for "the camera"? Yes he would. And over a barrage of complaints from reporters who begged "the camera" to give "the working press" a chance the room was bathed in floodlight and Mr. Dulles hopped obligingly to his feet to read for 2 minutes into a microphone.

After he finished another request was made. Would he read one more minute "for tape"? More anguished appeals to consider the working press clashed with shouted demands for silence by "tape". And Mr. Dulles read from his text for one more minute.

He again consulted his watch. He really must be going. Just one more question, he was asked. He politely sat back down.

How accurate did Mr. Dulles think current intelligence on Russian missile capability? Mr. Dulles paused in obvious thought. He blew a contemplative stream of smoke at the ceiling. Pencils poised expectantly.

There is an element of uncertainty in intelligence, he admitted.

And that was it. With more laughter, more handshakes, Mr. Dulles thanked everybody for their kindness and cooperation. He gave one last delighted smile around the room and vanished forever into the outer regions of the Astor hotel. ▲

Southern Cal. (cont'd)

visit to the famous "Hall of Giants," where some of the industry's biggest metal-forming machines are located. 2 machines, a 200-ton capability STRETCH-WRAP FORM PRESS capable of stretching 6' x 24' sheets around plastic or steel dies, and the famous million-dollar 8000 ton HYDRAULIC PRESS proved to be the most popular with the group.

Basketball season is here again and our group is starting a basketball program to loosen up a few stiff joints. At present we plan to challenge a few social fraternities and professional societies at USC.

Robert H. Jones, Secretary

Stanford

MANY SPEAKERS

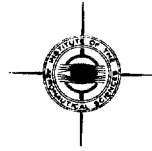
At our first technical meeting, the Branch was privileged to have Mr. R. T. Jones, distinguished member of the Ames Laboratory staff, discuss "Conformal Mapping in the Theory of Relativity". A large group was in attendance to hear this learned scientist.

At the second session, Mr. John C. Oram of Lockheed Missile Division presented his excellent paper on "Some Considerations of Re-entry Body Materials".

During the winter quarter Dr. S. Timoshenko, Professor Emeritus of the Engineering Mechanics Department, will

(continued on page12)

BRANCH NEWS



Stanford (cont'd)

address a joint IAS, ASME, and ASCE student meeting. Dr. Nicholas J. Hoff, Head of the Department of Aeronautical Engineering, is traveling to Russia during January and will relate some of his observations to the Branch after his return in February.

The following officers were elected: Hanagud V. Sathyanarayana, President, Joseph S. Davis, Treasurer, and Alton H. Quanbeck, Secretary.

A. H. Quanbeck, **Secretary**

Texas A & M

PROBLEMS AND SOLUTIONS

James E. Martin, Chief of Structures, Chance Vought (Dallas) was the guest speaker at the Branch meeting held Nov. 17. Mr. Martin presented an interesting and informative talk on the "Design Problems of Carrier Aircraft."

He began his talk with a brief description of modern aircraft carriers and their operation, including a discussion of several fairly recent developments, such as the mirror landing system, canted deck carriers and steam catapults. After this introduction Mr. Martin discussed in some detail the structural problems encountered in designing and building an aircraft to withstand the heavy loads imposed by catapult shots and arrested landings. He pointed out how these problems had been solved in various aircraft, in particular Chance Vought's F8U-1 **Crusader**.

Mr. Martin concluded his talk by showing a movie of the F8U-1 during carrier operations. The movie, which included an emergency barricade engagement, showed quite clearly the great demands made upon a carrier aircraft.

Joe K. Heilhecker, **Corresponding Secretary**

received . . . THE IAS LIBRARY HAS RECEIVED A COPY OF A MASTERS THESIS, "LOSSES IN A JET - FLAP COMPRESSOR CASCADE," PREPARED BY ERIC F. BROCHER, A GRADUATE STUDENT AT CORNELL UNIVERSITY, AND STUDENT BRANCH MEMBER.

U.S. Naval Postgraduate School HYPERSONIC FLIGHT

The Branch continued its policy of featuring speakers and subjects not normally found on campus. The monthly meeting (Nov. 24) featured Dr. Alfred J. Eggers, Jr., Chief of the Personnel Environment Branch at NASA's Ames Research Center. The title of the lecture was "Some Considerations of Aircraft Configuration Suitable for Long-Range Hypersonic Flight." The talk was patterned mainly on a paper presented by Dr. Eggers to a Symposium on Hypersonic Flow at the University of Bristol, England, April 6, 1959.

Dr. Eggers' very interesting lecture pointed out the primary considerations in this field are the lift-drag ratio and aerodynamic heating. He discussed the early work of Eugene Sanger regarding the manned glider concept. Various body and wing shapes were discussed. From elementary momentum considerations it is concluded that positioning the body entirely below the wing is especially attractive. With the proper selection of body and wing shapes, it was shown that according to theory and experiment the flat top type body develops 15 to 20% higher lift-drag ratios than the flat bottom or symmetrical counterparts. Maximum lift-drag ratios of flat top aircraft configuration are attractive at Mach numbers up to 10. However, Dr. Eggers pointed out that at higher Mach numbers these ratios decrease noticeably while aerodynamic heating then assumes major proportions.

Lt. R. Bruce Borthwick, USN,
Corresponding Secretary

IN APRIL—

A PROFILE OF GENERAL PUTT
1960 IAS PRESIDENT —



Prof. Ray Bisplinghoff
(M.I.T.)

writes on
"trends in
aeronautical
engineering education"



also: A Few Words About G(round) E(ffect) M(achine)'s

MORE ON 1960 REGIONAL STUDENT CONFERENCES

etc . . .